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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/676,494

09/30/2003

Mark Moyer

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7590

11/09/2006

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EXAMINER

CHAUDRY, MUJTABA M

ART UNIT

PAPER NUMBER

2133

DATE MAILED: 11/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/676,494

Applicant(s)

MOYER ET AL.

Examiner

Mujtaba K. Chaudry

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-7, 9-13, 15-17, 19, 20 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7, 9-13, 15-17, 19, 20 and 25-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Applicants' response was received September 05, 2006.

- Claims 1-3, 5-7, 9-13, 15-17, 19-20 and 25-28 stand rejected.

Application pending.

Response to Amendment

Applicant's arguments/amendments with respect to amended claims 1, 11 and 15, previously presented claims 2, 3, 5-7, 10, 12, 13, 16, 17, 19 and 20, newly added claims 25-28 and cancelled claims 4, 8, 14, 18 and 21-24 filed September 05, 2006 have been received. All arguments have been fully considered but are not persuasive. The Examiner would like to point out that this action is made final (See MPEP 706.07a).

Applicant contends, "...the prior arts of record do not teach or suggest the logic block to be configured as a RAM and therefore the claims [should be] are allowable over the prior art..." The Examiner respectfully disagrees. The claim as amended (i.e., claim 1) recites, "...indicating whether the associated logic block is configured as a random access memory...the checksum excluding configuration data for logic blocks whose respective status indicator indicates the logic block is configured as random access memory..." In other words, the configuration data that is **NOT** from a RAM is checked by the checksum calculating engine. The claim limitations are confusing and raise issues under 35 USC 112, provided herein below. Therefore, even if the references do not teach the memory to be a RAM, it would not matter because it would never be tested anyway. Even if this were not the case and the claim actually recited calculating a

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checksum for a RAM, the prior art of record, Plants clearly teaches a configurable SRAM (i.e., abstract and Figure 1) which is a type of RAM and is a obvious engineering design choice to use them interchangeably.

The Examiner disagrees with the Applicant and maintains rejections with respect to amended claims 1, 11 and 15, previously presented claims 2, 3, 5-7, 10, 12, 13, 16, 17, 19 and 20, newly added claims 25-28. All arguments have been considered. It is the Examiner's conclusion that amended claims 1, 11 and 15, previously presented claims 2, 3, 5-7, 10, 12, 13, 16, 17, 19 and 20, newly added claims 25-28, as presented, are not patentably distinct or non-obvious over the prior art of record.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The claims recite limitations that are not clear. For example, "...indicating **whether** **the associated logic block is configured as a random access memory...**the checksum **excluding configuration data for logic blocks whose respective status indicator** **indicates the logic block is configured as random access memory...**" It is not clear

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on what the Applicants intended to limit since all the recitation basically excludes the any data that is associated with the RAM.

Appropriate correction is requested.

Claim 28 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- The claim recites limitations that are not clear. For example, "...a checksum calculation engine operable to cyclically process the configuration data during operation of the programmable logic device...the checksum calculation **excluding** a logic block or a memory block whose address is stored with the configuration data in the configuration memory..." The claim contradicts itself since it first says to the checksum engine processes the configuration data and then states that it excludes any data in the configuration memory. It is not clear what the Applicants intended to convey.

Appropriate correction is requested.

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 5-7, 9-13, 15-17, 19-20 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plants (USPN 6237124) further in view of Carmichael et al. (USPN 7036059).

As per claim 1, Plants substantially teaches (Figure 4 and col. 5) a FPGA 28 (analogous to programmable logic device) comprising a FPGA core 10 (analogous to configuration memory storing configuration data). Plants teaches (col. 4 and abstract) to perform cyclic redundancy check using cyclic redundancy circuit 40 to verify the integrity of the configuration data in the FPGA core 10. See Figure 4:

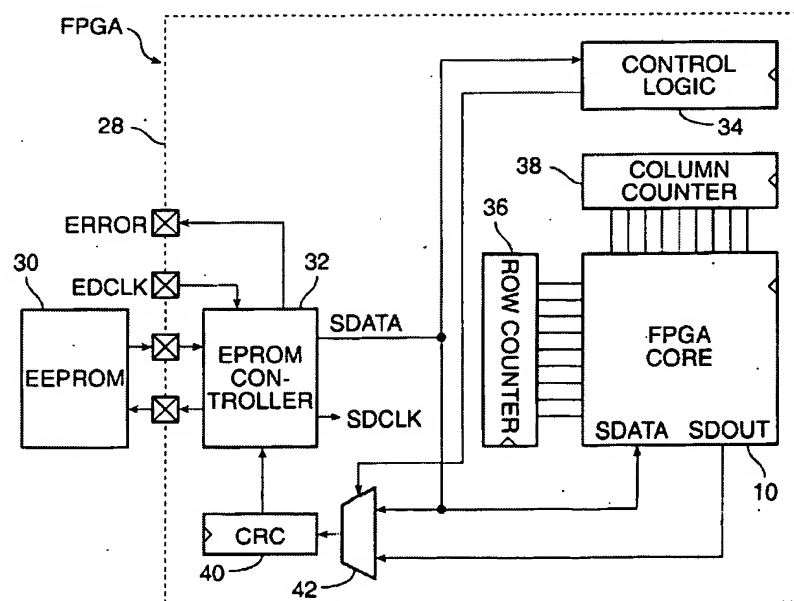


FIG. 4

Plants does not explicitly teach to calculate a checksum for the configuration data in the FPGA core as stated in the present application.

However, Carmichael et al. (herein after: Carmichael), in an analogous art, substantially teaches (col., 23, lines 20-30) to compare checksum in configuration data for a FPGA. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate a checksum for the configuration data in the FPGA in place of CRC as is taught by Plants. This modification would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would have recognized that the calculation process for the checksum and CRC are compatible, since a checksum is obtained by adding the digits in a numeral without regard to position or meaning. This sum is then compared to a predetermined checksum. In contrast, CRC is encoded within the data and is based on the data itself. Essentially, both are well known mechanisms for detecting faults in configuration data stored in FPGAs.

As per claim 2, Plants substantially teaches, in view of above rejections, the checksum calculation to be performed by the CRC 40 shown in Figure 4.

As per claim 3, Carmichael substantially teaches (col. 2, lines 1-15), in view of above rejections, to use parity calculation in determining the errors in the configuration data of the FPGA.

As per claim 5, Plants substantially teaches, in view of above rejections, the checksum calculation to be performed by the CRC 40 shown in Figure 4, which the Examiner would like to point out is well known to comprise LFSRs.

As per claims 6-7, Plants substantially teaches, in view of above rejections, the checksum calculation to be performed by the CRC 40 shown in Figure 4. Plants teaches to compare a predetermined CRC with the calculated CRC to verify the FPGA. Therefore the CRC 40 unit

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inherently has to have a register for storing the predetermined CRC in order to perform comparison analysis.

As per claim 9, Carmichael substantially teaches (Figure 13 and col. 23, lines 20-35), in view of above rejection, to store a first type of configuration data and a second type of configuration data. Carmichael teaches a way of using the dual device dual logic technique in an alternative architecture. A dual voting system 84, based on duplicate logic functions, incorporates into two FPGAs 86, 87 and a storage PROM 88 a fully redundant, self-mitigating system with built-in SEU detection and correction. The system 84 further comprises the user's basic design (logic) 90, 91; duplicates of the basic design (duplicate logic) 92, 93; a STARTUP component (primitive) 94, 95; a constant Low output 96, 97; a falling edge detector 98, 99, support logic 100, 101; and a state machine 106, 107 to control readback of configuration memory and auto-configuration of the neighboring FPGA 86, 87. See rejection under 35 USC 112.

As per claims 10 and 26-27, Plants substantially teaches, in view of above rejections, the checksum calculation to be performed by the CRC 40 shown in Figure 4. Plants teaches to compare a predetermined CRC with the calculated CRC to verify the FPGA. Therefore the CRC 40 unit inherently has to have a register for storing the predetermined CRC in order to perform comparison analysis. The Examiner would like to point out that CRC 40, which performs CRC calculation and comparison is on dedicated circuitry within the FPGA.

As per claim 11, Plants substantially teaches (Figure 4 and col. 5) a FPGA 28 (analogous to programmable logic device) comprising a FPGA core 10 (analogous to configuration memory storing configuration data). Plants teaches (col. 4 and abstract) to perform cyclic redundancy

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check using cyclic redundancy circuit 40 to verify the integrity of the configuration data in the FPGA core 10. See Figure 4.

Plants does not explicitly teach to calculate a checksum for the configuration data in the FPGA core as stated in the present application.

However, Carmichael et al. (herein after: Carmichael), in an analogous art, substantially teaches (col., 23, lines 20-30) to compare checksum in configuration data for a FPGA. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate a checksum for the configuration data in the FPGA in place of CRC as is taught by Plants. This modification would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would have recognized that the calculation process for the checksum and CRC are compatible, since a checksum is obtained by adding the digits in a numeral without regard to position or meaning. This sum is then compared to a predetermined checksum. In contrast, CRC is encoded within the data and is based on the data itself. Essentially, both are well known mechanisms for detecting faults in configuration data stored in FPGAs.

As per claim 12, Plants substantially teaches, in view of above rejections, the checksum calculation to be performed by the CRC 40 shown in Figure 4.

As per claim 13, Plants substantially teaches, in view of above rejections, the checksum calculation to be performed by the CRC 40 shown in Figure 4. Plants teaches to compare a predetermined CRC with the calculated CRC to verify the FPGA. Therefore the CRC 40 unit inherently has to have a register for storing the predetermined CRC in order to perform comparison analysis.

As per claim 15, Plants substantially teaches (Figure 4 and col. 5) a FPGA 28 (analogous to programmable logic device) comprising a FPGA core 10 (analogous to configuration memory storing configuration data). Plants teaches (col. 4 and abstract) to perform cyclic redundancy check using cyclic redundancy circuit 40 to verify the integrity of the configuration data in the FPGA core 10. See Figure 4.

Plants does not explicitly teach to calculate a checksum for the configuration data in the FPGA core as stated in the present application.

However, Carmichael et al. (herein after: Carmichael), in an analogous art, substantially teaches (col., 23, lines 20-30) to compare checksum in configuration data for a FPGA. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate a checksum for the configuration data in the FPGA in place of CRC as is taught by Plants. This modification would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would have recognized that the calculation process for the checksum and CRC are compatible, since a checksum is obtained by adding the digits in a numeral without regard to position or meaning. This sum is then compared to a predetermined checksum. In contrast, CRC is encoded within the data and is based on the data itself. Essentially, both are well known mechanisms for detecting faults in configuration data stored in FPGAs.

As per claims 16-17, Plants substantially teaches, in view of above rejections, the checksum calculation to be performed by the CRC 40 shown in Figure 4. Plants teaches to compare a predetermined CRC with the calculated CRC to verify the FPGA. Therefore the CRC

40 unit stores the predetermined CRC in order to perform comparison analysis within the FPGA as shown in Figure 4.

As per claims 19-20, Plants substantially teaches, in view of above rejections, the checksum calculation to be performed by the CRC.40 shown in Figure 4. Plants teaches to compare a predetermined CRC with the calculated CRC to verify the FPGA. This method verifies the integrity of the FPGA's configuration data and accordingly flags the corrupted data.

As per claim 25, Plants substantially teaches, in view of above rejections, (abstract) a SRAM and the process of reading data from it is analogous to reconfiguring as stated in the claim.

As per claim 28, Plants substantially teaches (Figure 4 and col. 5) a FPGA 28 (analogous to programmable logic device) comprising a FPGA core 10 (analogous to configuration memory storing configuration data). Plants teaches (col. 4 and abstract) to perform cyclic redundancy check using cyclic redundancy circuit 40 to verify the integrity of the configuration data in the FPGA core 10.

Plants does not explicitly teach to calculate a checksum for the configuration data in the FPGA core as stated in the present application.

However, Carmichael et al. (herein after: Carmichael), in an analogous art, substantially teaches (col., 23, lines 20-30) to compare checksum in configuration data for a FPGA. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate a checksum for the configuration data in the FPGA in place of CRC as is taught by Plants. This modification would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would have recognized that the

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calculation process for the checksum and CRC are compatible, since a checksum is obtained by adding the digits in a numeral without regard to position or meaning. This sum is then compared to a predetermined checksum. In contrast, CRC is encoded within the data and is based on the data itself. Essentially, both are well known mechanisms for detecting faults in configuration data stored in FPGAs.


Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiries concerning this communication should be directed to the examiner, Mujtaba Chaudry who may be reached at 571-272-3817. The examiner may normally be reached Mon – Thur 6:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, please contact the examiner's supervisor, Albert DeCady at 571-272-3819.


Mujtaba Chaudry
Art Unit 2133
October 31, 2006


ALBERT DECADY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100